What is Claimed is:

1. An apparatus for generating an output waveform at a desired frequency comprising:

a plurality of waveform synthesizers each generating an intermediate waveform of an intermediate frequency and including a maximum sampling rate, wherein said intermediate frequency is less than said desired frequency and said maximum sampling rate is less than a minimum sampling frequency required for generation of said output waveform; and

a waveform generator to combine said intermediate waveforms from said waveform synthesizers to produce said output waveform.

2. The apparatus of claim 1, wherein at least said plurality of synthesizers is in the form of at least one of a field programmable gate array (FPGA) and an application specific integrated circuit (ASIC).

3. The apparatus of claim 1, wherein said waveform synthesizers produce a quantity of said intermediate waveforms proportional to said minimum sampling frequency divided by said maximum sampling rate of said synthesizers.

4. The apparatus of claim 1, wherein each waveform synthesizer includes:

a phase accumulator to produce a phase value of said intermediate waveform; and

a phase converter to generate intermediate waveform amplitudes in accordance with phase values produced by said phase accumulator to generate said intermediate waveform.

5. The apparatus of claim 4, wherein said intermediate waveform amplitudes generated by said phase converter are in the form of at least one of sine and cosine values.

6. The apparatus of claim 4, wherein each synthesizer further includes:

a modulation module to produce a modulated intermediate waveform;

wherein said waveform generator combines said modulated intermediate waveforms from said waveform synthesizers to produce said output waveform with modulation.

7. The apparatus of claim 6, wherein said modulation module includes:

a phase modulation module to apply a phase offset to said phase value to enable said phase converter to generate a phase modulated intermediate waveform;

wherein said waveform generator combines said phase modulated intermediate waveforms from said waveform synthesizers to produce said output waveform with phase modulation.

8. The apparatus of claim 6, wherein said modulation module includes:

a frequency modulation module to apply a frequency offset to said phase value to enable said phase converter to produce a frequency modulated intermediate waveform;

wherein said waveform generator combines said frequency modulated intermediate waveforms from said waveform synthesizers to produce said output waveform with frequency modulation.

9. The apparatus of claim 6, wherein said modulation module includes:

an amplitude modulation module to apply amplitude offsets to said intermediate waveform amplitudes to produce an amplitude modulated intermediate waveform;

wherein said waveform generator combines said amplitude modulated intermediate waveforms from said waveform synthesizers to produce said output waveform with amplitude modulation.

10. The apparatus of claim 4, wherein said waveform generator includes:

a multiplexer to combine said intermediate waveforms from said waveform synthesizers to produce a digital waveform corresponding to said output waveform; and

a digital-to-analog converter to convert said digital waveform to said output waveform in analog form including said desired frequency.

11. The apparatus of claim 10, wherein each waveform synthesizer applies a corresponding phase offset to said phase value to produce said intermediate waveforms successively shifted in phase relative to each other and collectively encompassing samples of said output waveform.

12. The apparatus of claim 11, wherein said multiplexer selects and retrieves said output waveform samples from each successive intermediate waveform in a cyclical fashion to produce said digital waveform corresponding to said output waveform.

13. A method of generating an output waveform at a desired frequency comprising:

(a) generating a plurality of intermediate waveforms each of an intermediate frequency, wherein said intermediate waveforms are generated by corresponding waveform synthesizers including a maximum sampling rate and said intermediate frequency is less than said desired frequency and said maximum sampling rate is less than a minimum sampling frequency required for generation of said output waveform; and

(b) combining said intermediate waveforms to produce said output waveform.

14. The method of claim 13, wherein step (a) further includes:

(a.1) generating a quantity of said intermediate waveforms proportional to said minimum sampling frequency divided by said maximum sampling rate of said synthesizers.

15. The method of claim 13, wherein step (a) further includes:

(a.1) generating each intermediate waveform by producing phase values of said intermediate waveform and determining intermediate waveform amplitudes in accordance with said produced phase values.

16. The method of claim 15, wherein step (a.1) further includes:

(a.1.1) determining said intermediate waveform amplitudes in the form of at least one of sine and cosine values.

17. The method of claim 15, wherein step (a.1) further includes:

(a.1.1) generating each intermediate waveform as a modulated waveform; and

step (b) further includes:

(b.1) combining said modulated intermediate waveforms to produce said output waveform with modulation.

18. The method of claim 17, wherein step (a.1.1) further includes:

(a.1.1.1) applying a phase offset to said phase values to generate each intermediate waveform as a phase modulated waveform; and

step (b.1) further includes:

(b.1.1) combining said phase modulated intermediate waveforms to produce said output waveform with phase modulation.

19. The method of claim 17, wherein step (a.1.1) further includes:

(a.1.1.1) applying a frequency offset to said phase values to generate each intermediate waveform as a frequency modulated waveform; and

step (b.1) further includes:

(b.1.1) combining said frequency modulated intermediate waveforms to produce said output waveform with frequency modulation.

20. The method of claim 17, wherein step (a.1.1) further includes:

(a.1.1.1) applying amplitude offsets to said intermediate waveform amplitudes to generate each intermediate waveform as an amplitude modulated waveform; and

step (b.1) further includes:

(b.1.1) combining said amplitude modulated intermediate waveforms to produce said output waveform with amplitude modulation.

21. The method of claim 15, wherein step (b) further includes:

(b.1) combining said intermediate waveforms via a multiplexer to produce a digital waveform corresponding to said output waveform; and

(b.2) converting said digital waveform to said output waveform in analog form including said desired frequency.

22. The method of claim 21, wherein step (a.1) further includes:

(a.1.1) applying a corresponding phase offset to said phase values to produce said intermediate waveforms successively shifted in phase relative to each other and collectively encompassing samples of said output waveform.

23. The method of claim 22, wherein step (b.1) further includes:

(b.1.1) selecting and retrieving said output waveform samples from each successive intermediate waveform in a cyclical fashion to produce said digital waveform corresponding to said output waveform.